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Forest Statistics

for

Central Maryland

Northeastern Forest Experiment Station

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Forest Service, U.S. Dept. of Agriculture

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FOREWORD

This is the second of three preliminary reports about forest areas and timber volume in the State of Maryland. It is a product of the forest survey of the Northeast, carried on by the Northeastern Forest Experiment Station as part of the nationwide forest survey being made by the Forest Service, U. S. Department of Agriculture.

A similar report for Western Maryland has been published; and one will be prepared for the Eastern Shore.

The Maryland Department of State Forests and Parks, Department of Research and Education, and Department of Game and Inland Fish supplied the necessary aerial photographs. The Department of Research and Education also provided half the field personnel and cooperated in many other phases of the survey.

Field work in Central Maryland was supervised by Harry W. Camp, Jr. C. Allen Bickford developed the statistical procedures used in the survey. Computations were made under the supervision of Roland H. Ferguson.

Ralph W. Marquis

Ralph W. Marquis
Director

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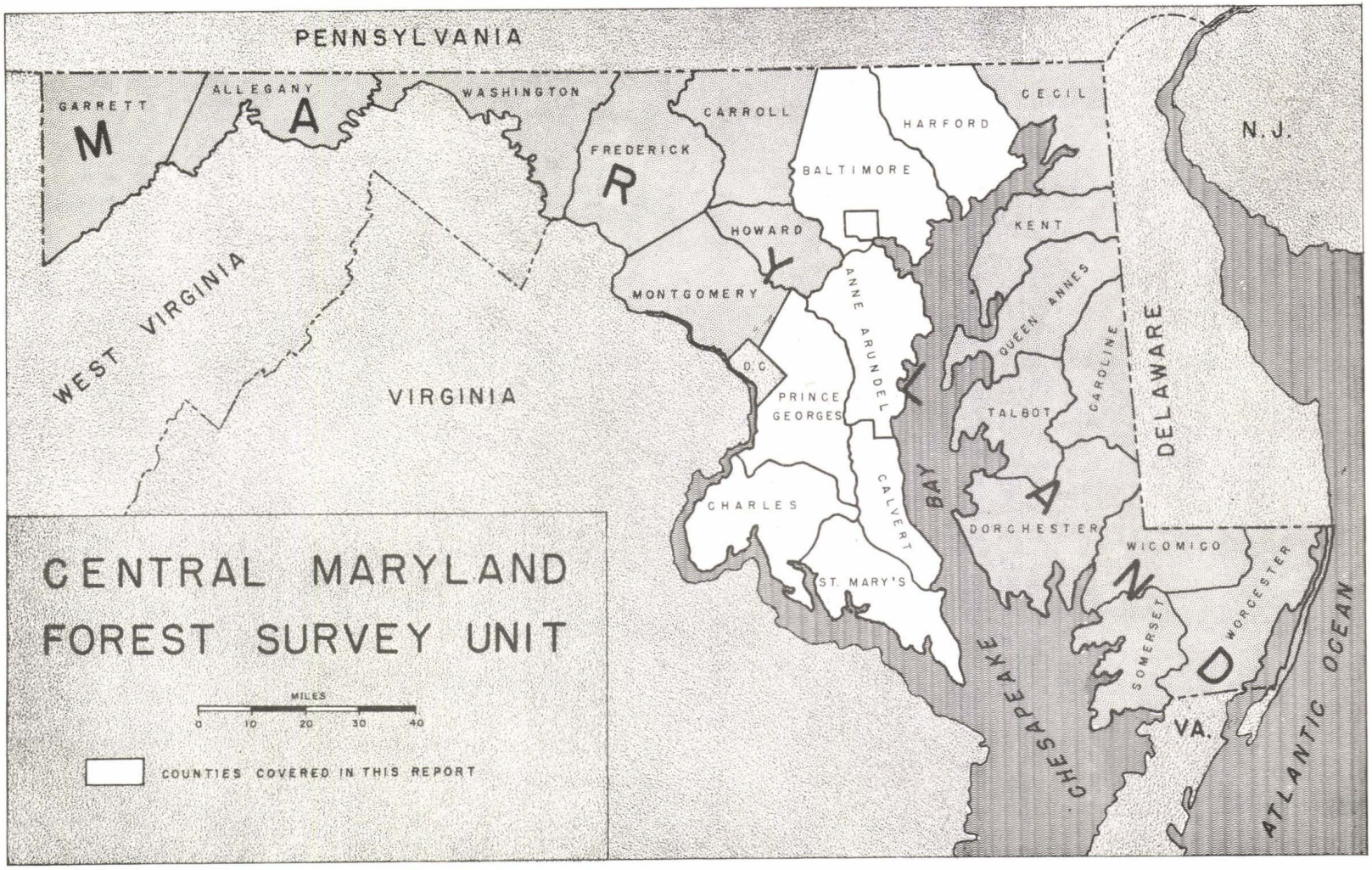
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FOREST STATISTICS

FOR

CENTRAL MARYLAND

by

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Northeastern Forest Experiment Station
Forest Service, U.S. Dept. Agriculture

GENERAL

CENTRAL MARYLAND includes seven counties: Harford, Baltimore, Anne Arundel, Prince Georges, Calvert, Charles, and St. Marys. These counties border on the western shore of Chesapeake Bay and on Potomac River tidewater.

Approximately two-thirds of this land area is in the Coastal Plain. The land here is relatively flat, with considerable acreage in marsh. Nowhere in this area does the elevation exceed 300 feet.

The other one-third of the area, the northern part, is in the Piedmont Plateau. Harford and Baltimore Counties are in this Plateau region. Elevations here range up to more than 800 feet above sea level.

The Forest Area

Central Maryland has a total land area of nearly 2 million acres. More than half of this is forest land. Commercial forest land totals 1,100,300 acres. An additional 1,700 forest acres are reserved from timber cutting.

In the Coastal Plain, 62 percent of the land acreage is commercial forest land; in the Piedmont Plateau only 42 percent of the land area is commercial forest land. The difference is due chiefly to the greater suitability of the Piedmont Plateau for farming.

Ownership

Of all the commercial forest land, 93 percent is in private ownership. Farm forests account for 35 percent and nonfarm private holdings 58 percent. The balance is publicly owned; U. S. military agencies administer the major portion.

The Forest Types

Various oak types occupy 43 percent of the commercial forest land. Red oak is the most extensive oak type; it accounts for 17 percent. White oak follows closely with 14 percent, and other oak types combine to make up 12 percent.

The yellow-poplar and sweetgum--yellow-poplar types together cover 19 percent of the commercial forest area, and bottomland hardwoods cover 9 percent.

The most extensive single type is pitch pine-shortleaf pine-Virginia pine, which occupies 21 percent of the commercial forest land. This type is widespread throughout the five counties south of Baltimore.

The only other softwood types of any consequence are loblolly pine, loblolly pine-hardwood, and hard pine-oak. Combined, these types occupy 8 percent of the commercial forest land.

Condition Of The Forests

Distribution of stand-size classes indicates that the condition of the forests in Central Maryland is better than the average for the northeastern United States.

A total of 55 percent of the commercial forest land bears sawtimber stands. Stands of more than 5,000 board feet per acre occupy 23 percent of the commercial forest area, and stands of 1,500 to 5,000 board feet per acre occupy 32 percent.

Approximately 20 percent of the commercial forest land is in poletimber stands.

The remaining one-fourth of the commercial forest area is covered with stands in which trees of sapling size and smaller predominate. Forest lands less than 10 percent stocked are also included here.

Timber Volume

There are slightly more than 3 billion board feet (International $\frac{1}{4}$-inch rule) of live sawtimber on commercial forest land in Central Maryland. Approximately 96 percent of this volume is in sawtimber stands. Most of it may be considered economically operable either at present or in the near future.

The oaks account for 35 percent of the total board-foot volume, with the red oak group making up 19 percent, white oaks 13 percent, and chestnut oak 3 percent. The individual species with the greatest sawtimber volume is yellow-poplar--21 percent of the total volume.

Sweetgum makes up 11 percent of the volume, and other hardwoods account for 17 percent. All softwoods make up only 16 percent of the total sawtimber volume.

The growing stock totals 993 million cubic feet, 744 million in hardwood species. Of the hardwood growing stock, 66 percent is in trees of sawtimber size. Slightly less than half of the 249 million cubic feet of softwood growing stock is in sawtimber trees.

The total cubic volume of growing stock is equivalent to some 12 million standard rough cords.

Table 1.--Land area in Central Maryland, by major classes of forest land, 1950

Class of land[1]	Physiographic region		Total	
	Coastal plain	Piedmont plateau		
	Acres	Acres	Acres	Percent
Forest land:				
Commercial	843,900	256,400	1,100,300	56
Noncommercial	1,700	--	1,700	(2/)
	845,600	256,400	1,102,000	56
Nonforest land	513,300	357,800	871,100	44
All land[3]	1,358,900	614,200	1,973,100	100

[1]See Appendix for definitions.

[2]Less than 1 percent. Includes Patapsco State Park and other State and Federal forest areas that are reserved from timber cutting.

[3]Census of Agriculture, 1950. Water areas of 1 to 40 acres are included here in the estimate of nonforest acreage.

Table 2.--Land area and commercial forest-land area in Central Maryland, by county, 1950

County	Land area	Commercial forest-land area	
	Acres	Acres	Percent
Harford	286,700	102,600	36
Baltimore[1]	440,900	173,100	39
Anne Arundel	266,900	174,200	65
Prince Georges	310,400	187,600	60
Calvert	140,200	92,000	66
Charles	293,100	214,800	73
St. Mary's	234,900	156,000	66
Total	1,973,100	1,100,300	56

[1]County and city.

Table 3.--Commercial forest-land area in Central Maryland, by ownership, 1950

Ownership class	Acreage held	
	Acres	Percent
Private:		
Farm forest land[1]	387,500	35
Other private	638,400	58
Total private	1,025,900	93
Public:		
Federal[2]	51,900	5
Municipal[3]	15,200	1
State[4]	7,300	1
Total public	74,400	7
All ownerships	1,100,300	100

[1]Census of Agriculture, 1950.

[2]Includes 1,500 acres in the U. S. Fish and Wildlife Service Patuxent Wildlife Refuge; 2,500 acres administered by the Federal Housing Authority; 7,600 acres in the U. S. Department of Agriculture Research Center at Beltsville; and 40,300 acres administered by the U. S. Army, Navy, or Air Force.

[3]Includes 14,500 acres owned by Baltimore City and 700 acres owned by Annapolis. These are reservoir sites.

[4]Includes 4,900 acres in state forests and 2,400 acres administered by state agencies other than the Department of State Forests and Parks.

Table 4.--Commercial forest-land area in Central Maryland, by forest type, 1950

Forest type	Area	
	Acres	Percent
Pitch pine-shortleaf pine-Virginia pine	231,900	21
Hard pine-oak	48,100	4
Loblolly pine and loblolly pine-hardwood	46,700	4
Red oak	185,400	17
White oak	156,400	14
Other oak types	130,500	12
Sweetgum--yellow-poplar	147,500	14
Yellow-poplar	51,000	5
Bottomland hardwood and river birch-sycamore	102,800	9
All types	1,100,300	100

Table 5.--Commercial forest-land area in Central Maryland, by stand-size class and forest-type group, 1950

Forest type	Sawtimber stands		Poletimber stands	Seedling and sapling stands and other areas	Total
	More than 5,000 bd.ft. per acre	1,500-5,000 bd.ft. per acre			
	Acres	Acres	Acres	Acres	Acres
Softwood types	30,100	94,300	91,800	110,500	326,700
Oak types	132,500	185,500	57,000	97,300	472,300
Other hardwood types	86,600	75,600	59,000	80,100	301,300
All types	249,200	355,400	207,800	287,900	1,100,300
Percent	23	32	19	26	100

Table 6.--Commercial forest-land area in Central Maryland, by stand-size class and watershed, 1950

Stand-size class	Watershed			Total
	Patuxent River	Potomac River	Upper Chesapeake Bay[1]	
	Acres	Acres	Acres	Acres
Sawtimber stands:				
More than 5,000 bd.ft. per acre	60,000	102,300	86,900	249,200
1,500-5,000 bd.ft. per acre	85,800	144,100	125,500	355,400
Poletimber stands	51,500	63,000	93,300	207,800
Other stands	83,800	57,500	146,600	287,900
All stands	281,100	366,900	452,300	1,100,300
Percent	26	33	41	100

[1] Includes 35,000 acres of the Lower Susquehanna River watershed.

Table 7.--Net volume of live timber on commercial forest land in Central Maryland, by species, 1950

Species	Growing stock[1]		Saw-timber[2]
	Thousand cu.ft.	Equivalent in cords	Thousand bd.ft.
Virginia pine	184,700	2,308,700	235,200
Loblolly pine	53,400	667,500	198,100
Other softwood	10,800	135,000	43,800
All softwood	248,900	3,111,200	477,100
Yellow-poplar	165,100	2,063,800	647,600
White oak	108,400	1,355,000	383,700
Sweetgum	109,400	1,367,500	332,700
Northern red oak	37,200	465,000	149,400
Southern red oak	29,700	371,200	110,400
Scarlet oak	22,300	278,800	80,500
Other red oaks	62,200	777,500	233,700
Beech	33,500	418,800	128,200
Hickory	33,200	415,000	99,200
Red maple	32,700	408,700	90,000
Chestnut oak	24,900	311,200	88,400
Blackgum	20,200	252,500	57,600
Sycamore	19,000	237,500	48,100
Other hardwood[3]	46,600	582,500	85,900
All hardwood	744,400	9,305,000	2,535,400
All species[4]	993,300	12,416,200	3,012,500

[1]Cord equivalent is in rough, standard cords assumed to average 80 cubic feet of solid wood.

[2]Log scale, International $\frac{1}{4}$-inch rule.

[3]Excludes 2,600,000 cubic feet or 32,500 cords of so-called noncommercial species such as box elder and sassafras. The board-foot volume in such species is negligible.

[4]Excludes 59,300,000 cubic feet of sound material in these trees, some of which is suitable for local use. Also excludes the net volume of cull trees; 2,200,000 cubic feet.

Table 8.--Net volume of live timber on commercial forest land in Central Maryland, by diameter class, 1950

Diameter class[1] (inches at breast height)	Growing stock	Saw-timber
	Thousand cu.ft.	Thousand bd.ft.
Softwood:		
6	53,100	--
8	83,100	--
10	37,800	131,200
12	29,400	126,500
14	25,000	112,600
16	9,800	49,700
18	5,300	26,800
20 and more	5,400	30,300
All softwood	248,900	477,100
Hardwood:		
6	54,900	--
8	79,800	--
10	120,800	--
12	79,700	336,400
14	98,600	470,200
16	92,000	472,800
18	60,700	324,600
20	54,700	301,300
22	40,800	242,100
24	15,800	93,300
26	10,800	70,000
28	12,300	76,600
30	7,500	46,800
32 and more	16,000	101,300
All hardwood	744,400	2,535,400
Total	993,300	3,012,500

[1]The midpoint of each 2-inch diameter class is indicated: thus 6.0 inches is the midpoint of the 6-inch diameter class.

Table 9.--Average net volume of live timber per acre of commercial forest land in Central Maryland, by stand-size class, 1950

Stand-size class (and acreage of each class)	Growing stock	Sawtimber
	Cubic feet	Board feet
Sawtimber stands:		
More than 5,000 bd.ft. per acre (249,200 acres)	1,830	7,600
1,500-5,000 bd.ft. per acre (355,400 acres)	1,050	2,800
Poletimber stands:		
More than 600 cu.ft. per acre (129,300 acres)	910	590
200-600 cu.ft. per acre (78,500 acres)	380	390
Other stands (287,900 acres)	50	60
Average, all stands[1] (1,100,300 acres)	900	2,740

[1]Hardwood constitutes 84 percent of the total board-foot volume, or 75 percent of the total cubic-foot volume, in the average stand.

Table 10.--Net volume of live timber on commercial forest land in Central Maryland, by physiographic region and forest-type group, 1950

Forest type	Growing stock	Saw-timber
	Thousand cu.ft.	Thousand bd.ft.
COASTAL PLAIN		
Softwood types	262,600	484,200
Oak types	273,600	990,900
Other types	268,700	883,900
All types	804,900	2,359,000
PIEDMONT PLATEAU		
Oak types	122,100	418,400
Other types[1]	66,300	235,100
All types	188,400	653,500

[1] Volume in softwood type is negligible.

APPENDIX

DEFINITIONS OF TERMS

Forest Area

Forest land area.--Includes (a) lands that are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which has not been developed for other use; and (c) afforested areas. (Forest tracts of less than 1 acre and isolated strips of timber less than 120 feet wide, and abandoned fields and pastures not yet 10 percent stocked are excluded.)

Commercial forest land area.--Forest land that is (a) producing, or physically capable of producing, usable crops of wood (usually sawtimber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land area.--Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order, but that otherwise qualifies as commercial forest land, or (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions.

Forest Types

Forest types are defined according to the species, or species group, that makes up the major portion of the stand in terms of cubic feet in sawtimber and poletimber stands, and number of stems in seedling and sapling stands.

Stand-Size Classes

Sawtimber stands.--Stands with sawtimber trees having a minimum net volume per acre of 1,500 board feet, International $\frac{1}{4}$-inch rule.

Poletimber stands.--Stands that fail to meet the sawtimber stand specifications, but are at least 10 percent stocked with poletimber and larger trees (5.0 inches and larger), and with at least half the minimum volume in poletimber trees. (Poletimber stands carry at least 200 cubic feet per acre.)

Seedling and sapling stands.--Stands that do not qualify as either sawtimber or poletimber stands, but have at least 10 percent stocking of trees of commercial species and with at least half the minimum stocking in seedling and sapling trees.

Other areas.--Forest land areas that do not qualify as sawtimber, poletimber, or seedling and sapling stands. (Includes nonstocked areas.)

Tree Classes

Sawtimber trees.--Trees of commercial species that contain at least one merchantable sawlog as defined by regional practice and that are of the following minimum diameters at breast height (d.b.h.): Softwoods 9.0 inches and hardwoods 11.0 inches. (All butt sawlogs are considered merchantable. Where the butt is defective, upper sawlogs are considered merchantable if they account--in terms of aggregate net volume--for 50 percent or more of the gross volume below the top of the uppermost sawlog. Softwood sawlogs are at least 6.0 inches in diameter, inside bark at small end; 8 to 16 feet in length; sound and straight enough to be manufactured into standard lumber. The smaller logs are generally free of surface defects other than small tight knots. Hardwood sawlogs are at least 8.0 inches in diameter inside bark at small end; 8 to 16 feet in length; suitable for sawing into standard lumber, construction timbers or ties.)

Poletimber trees.--Trees 5.0 inches d.b.h. and larger of commercial species that do not meet the specifications for sawtimber trees but do meet regional specifications of species, soundness, and freedom from defect. (These are the trees that are straight and clear enough to make sawtimber trees eventually.)

Seedling and sapling trees.--Trees of commercial species less than 5.0 inches in diameter at breast height.

Cull trees.--Live trees of sawtimber or poletimber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species.

Timber Volume

Growing stock.--Net volume, in cubic feet, of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

(This volume is also given in rough standard cords, bark included. Cord volume is derived from growing stock by applying a factor of 80 cubic feet per cord.)

Live sawtimber volume.--Net volume in board feet, International $\frac{1}{4}$-inch rule, of live sawtimber trees.

FOREST SURVEY METHODS

These forest statistics for Central Maryland are based on information gathered from aerial photographs and from sample plots examined on the ground.

First, photo-interpretation plots were marked off on the aerial photographs. These plots were distributed uniformly by mechanical means over photographs of the entire area. Trained photo-interpreters then classified each photo-plot as either forest or nonforest. Forest plots were further classified according to stand size and forest type.

Field crews inspected some of the photo-plots on the ground. Enough plots were selected at random so as to attain a specified level of statistical accuracy. Species and volume data were collected on these ground plots; and the photo classification of stand size and forest type was verified and--if necessary--changed.

The survey was designed for maximum accuracy in the estimate of total cubic volume.

ACCURACY OF THE ESTIMATES

The estimates in this report may contain two kinds of error.

First, photo-interpreters may make mistakes of judgment and fieldmen may make mistakes in measuring or recording. There is no practical way of finding out just how often such errors occur. They are kept to a minimum by careful training of the men involved and by closely checking all phases of the work.

The second kind of error is associated with sampling procedures. The size of this sampling error can be measured. In Central Maryland the probabilities are 2 out of 3 that the actual forest area is within $\pm$ 2.6 percent of the estimated forest area; that the actual cubic-foot volume is within $\pm$ 4.1 percent of the estimated cubic-foot volume; and that the actual board-foot volume is within $\pm$ 5.8 percent of the estimated board-foot volume. This does not include any mistakes in measurement or classification.

These percentages show that the area estimates are more reliable than the volume estimates, and that cubic-foot estimates are more reliable than the board-foot estimates.

In each of the tables, the total figures are more reliable than the subtotals. The subtotals are more reliable than any of the individual figures. Figures that are small in relation to totals are subject to larger sampling errors.

SPECIES TALLIED

The various commercial tree species tallied in Central Maryland are listed below.[1] Approved common names are shown in parentheses if these differ from the brief name used in the tables.

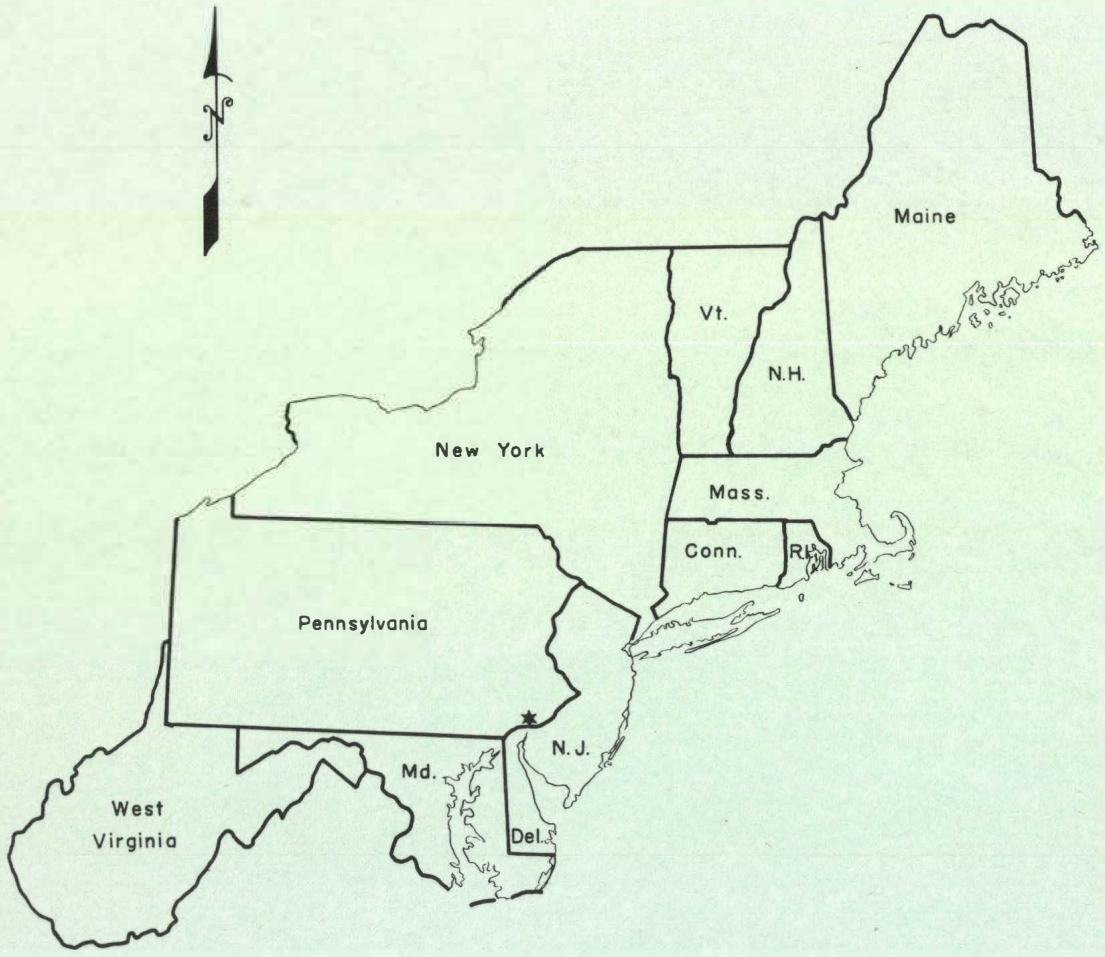
Softwoods

Virginia pine		- Pinus virginiana
Loblolly pine		- Pinus taeda
Other softwoods	(Pitch pine)	- Pinus rigida
	(Shortleaf pine)	- Pinus echinata
	(Eastern redcedar)	- Juniperus virginiana

Hardwoods

Red maple	(Red maple)	- Acer rubrum
	(Silver maple)	- Acer saccharinum
Northern red oak		- Quercus borealis
Southern red oak		- Quercus falcata
Scarlet oak		- Quercus coccinea
Other red oaks	(Black oak)	- Quercus velutina
	(Pin oak)	- Quercus palustris
	(Willow oak)	- Quercus phellos
White oak	(White oak)	- Quercus alba
	(Swamp white oak)	- Quercus bicolor
	(Overcup oak)	- Quercus lyrata
	(Post oak)	- Quercus stellata
Chestnut oak		- Quercus montana
Beech (American beech)		- Fagus grandifolia
Yellow-poplar		- Liriodendron tulipifera
Hickory		- Carya species
Sweetgum		- Liquidambar styraciflua
Blackgum		- Nyssa sylvatica
Sycamore		- Platanus occidentalis
Other hardwoods	(River birch)	- Betula nigra
	(Ash)	- Fraxinus species
	(American basswood)	- Tilia americana
	(Elm)	- Ulmus species
	(Black walnut)	- Juglans nigra
	(Black locust)	- Robinia pseudoacacia
	(Black cherry)	- Prunus serotina
	(Butternut)	- Juglans cinerea
	(Magnolia)	- Magnolia species

[1] U.S. FOREST SERVICE. CHECK LIST OF THE NATIVE AND NATURALIZED TREES OF THE UNITED STATES INCLUDING ALASKA. U.S. FOREST SERVICE. 325 PP. 1949.



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